

DETAILED ACTION

Claim Objections

1. Claim 17 is objected to because of the following informalities: Claim 17 recites “the other pair of armor plies” without proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 12 and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 12 recites “and at least one other of the armor plies”. It is not made clear what “one other” armor ply is referring to. Claim 13 recites that “the lay angle of the other armor ply is substantially equal to angles A and B of the first pair of armor plies”, which is not clear since the angles A and B have been recited as being different from each other.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 10, 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S.

5,934,335 to **Hardy**

The patent to **Hardy** discloses a flexible pipe comprising, from the inside to the outside, an inner polymer sheath (2), at least two crossed armor plies (4) consisting of windings wound helically

at opposing lay angles close to 55° and an outer polymer sheath (5) wherein there also is disclosed a layer (3) around the inner sheath and comprised of at least one winding with contiguous edges of the strip (fig. 3), with high mechanical properties and that the lay angles of the reinforcements are not equal. It is disclosed, col. 1, that the reinforcements have lay angles complementary from one layer to another, for example, a layer at 50° associated a layer at 60° , as recited in claims 1, 2, 10 and 15. As to the limitation of the hose being utilized for rotary drilling, it has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3, 6, 11-13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hardy** in view of U.S. 5,813,439 to **Herrero et al**

The **Hardy** reference discloses that the lay angle A of the lower ply is different from lay angle B of the upper ply but does not disclose which ply is higher than the other. The patent to **Herrero et al**. discloses a flexible pipe comprising an interlocked armoring web including armor plies (4 and 5). Col. 9, lines 5-9, in conjunction with fig. 2, discloses that the first interlocked web (4)

is wound with a high angle, around 75° , while second, outer web is around 28° . **Herrero et al.** discloses an alternative embodiment, fig. 3, including at least one other armor ply, having an angle substantially equal to one of the first pair of armor plies, as recited in claims 12 and 13. A second, alternate pair of armor plies (4,9) is provided at substantially the same lay angles of armor plies (5 8), as recited in claim 16 and 17. **Herrero et al.** further discloses that it is possible to insert various webs such as protective sleeves and tapings or optional thermal insulations between the armoring webs or between the inner sealing sleeve and the inner armoring web. It would have been obvious to one having ordinary skill in the art at the time the invention was made to provide the inner ply of **Hardy** with a greater lay angle than the outer and to provide a second, alternative pair of armor plies, both as suggested by **Herrero et al.** wherein it is known to provide various layers at either the same lay angle or differing lay angles in order to provide a balanced resistant armoring of the flexible pipe. It would have also been obvious at the time the invention was made to provide a layer or taping into which the armor wire is able to penetrate, also as suggested by **Herrero et al.** in order to provide heat barriers and/or chemical barriers between the layers of armor.

2. Claims 3 and 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Herrero et al.** in view of 3,481,368 to **Vansickle et al.**

The patent to **Hardy** discloses a flexible pipe including two layers of armoring wire which are laid in opposing direction with differing lay angles. The patent to **Herrero et al.** discloses that it is known to insert insulation layers in between the armoring layers into which a wire of the armor is able to penetrate. The patent to **Vansickle** also discloses a flexible armored pipe including a plurality of elastomeric insulation layers (17', 21, 23) between armoring layers (16', 20 and 22) formed of helically wound round wires. It would have been obvious to one having ordinary skill in

the art at the time the invention was made to insert between the reinforcing plies of **Herrero et al.** layers of an elastomeric insulation, as suggested by **Vansickle** in order to provide heat and/or chemical barrier layer within the pipe and to provide flexibility. As to the reinforcing layers including round wire or strand, It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the wire of a round cross section because Applicant has not disclosed that a round wire provides an advantage, or solves an stated problem, wherein one would expect Applicant's invention to perform equally well with a rectangular shaped cross-section. Therefore it would be an obvious choice to modify **Hardy** to obtain the invention as specified in claim 5.

3. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hardy** in view of 4,403,631 to **Abdullaev et al.**

Hardy discloses an anti-creep layer (3) wound with a close pitch provided under the armor ply, but does not specifically disclose it having a lay angle of approx. 70° . The patent to **Abdullaev et al.** discloses a layer (2) positioned in an anti creep position, wound at an angle to the axis of the pipe within the range of 60° and 85° . It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the anti creep layer of **Hardy** at an angle of approximately 70° , as suggested by **Abdullaev et al.** wherein it is known in the art that the term short pitch winding means to provide windings at a lay angle of between 70° and 80° .

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Hardy** in view of **Abdullaev et al.** as applied to claim 8 above, and further in view of U.S. 4,384,595 to **Washkewicz et al.**

Hardy, as modified, discloses an anti-creep layer (3) of close pitch, but does not disclose the windings as being comprised of Kevlar ®. The patent to **Washkewicz et al.** discloses a hose including an anti-creep layer of windings of Kevlar ® material. It is disclosed that due to Kevlar's ® high modulus of elasticity allows it to be stressed at low strain levels. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the anti creep layer of **Hardy**, as modified such that it is formed of Kevlar ® in order to produce a layer that prevent creep made from a strong material.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The patents to Dupoirion, Seguin et al., Jerrin et al., Bournazel et al., Briggs, Keister, Jung et al., Abdullaev et al '631 and '034, Sugier et al, Herrero et al. '109 and '439, Jung et al., and Feret et al. are all pertinent to Applicant's invention in disclosing armoured hoses having at least two plies that are oppositely wound.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Patrick F. Brinson** whose telephone number is (571)272-4897.

The examiner can normally be reached on M-F 7:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Kevin P. Shaver** can be reached on (571) 272-4720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Patrick F. Brinson/
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